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January 16, 2004

B.C. "Jay" Jackson, Jr.
Mobility Division
Wireless Telecommunications Bureau
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: WT Docket No. 02-86
AirCell, Inc. Petition for Extension of Waiver of 47 C.F.R. § 22.925
Reply to December 18, 2003 Letter from Katherine Harris

Dear Mr. Jackson:

AirCell, Inc. ("AirCell") is pleased to respond to the December 18, 2003 letter from Katherine M. Harris, Deputy Chief, Mobility Division ("Division"), Wireless Telecommunications Bureau, which requested certain data that the Division would find useful in completing its evaluation of the record in the above-referenced proceeding. Specifically, the letter requested AirCell to provide any readily available operating data showing the output power used by AirCell airborne transmitters in normal operations. The letter indicated that the data should reflect "in a broad representative sense, across the country, which power steps AirCell-equipped aircraft typically utilize, what actual transmitting power those steps represent, and what percentage of the transmitting time each of these steps are used." AirCell appreciates the opportunity to provide the following information and data in response to this request.

As an initial matter, AirCell has always taken very seriously its responsibility to be a good citizen to its cellular partners and their neighbors by taking elaborate steps to avoid causing harmful interference. We have spent literally millions of dollars and years in time developing the set of system equipment and operating parameters necessary to ensure non-interference. We designed the system to be non-interfering in any single aircraft scenario and extended our modeling to include probability statistics with literally thousands of simulated aircraft. We also performed flight tests for hundreds of hours before going fully operational in 1999 after AirCell's waiver authority was granted. Not only have we conducted our own tests, but we have also tested under the review of the FCC and carriers, in the 1997 "Texas tests," and with various cellular partners (*e.g.*, Alltel, US Cellular). Since the Texas tests in July of 1997, we have made a number of significant improvements to the AirCell system: we finalized the design of the aircraft mobile equipment, adding power limiting circuits to make sure that even under failure

modes the maximum radiated power from the aircraft could never exceed 75mw. We optimized the base station antennas and replaced all existing site antennas to improve system performance. We also optimized the RF path at the base stations, further reducing the power required from the mobiles. We developed and installed several smart antenna systems at critical locations, which also contributed to maximizing system performance while minimizing radiated power from the aircraft. Our network has expanded from 35 sites to 135 sites, while our customer base has grown from a few tens of aircraft to 1500, and monthly minutes-of-use have increased by a factor of 1000. Significantly, all of this has been accomplished without a single reported case of interference in normal use.

AirCell has invested heavily in its network to make sure it performs properly at all times. Over 80% of our 135 cell sites are monitored remotely, on a daily basis, by a custom designed cell site monitoring system that measures various parameters to verify consistent and proper site RF performance. AirCell technicians visit as many sites as possible on a rotating basis to test and tune each site on a continuous basis. We target to calibrate each site at least once per year. During these site calibrations we run full 20 dB SINAD tests on the system with input levels of -118 dBm. Every new cell site is flight tested when brought on line and, importantly, flight tests are also performed annually on all sites to verify proper operation. AirCell has literally flown a million miles in flight testing over the last five years

Call traces are not performed as a normal business practice for everyday customer calls, as doing so would require special data recording equipment on board the customer's aircraft or special permission and coordination on a call by call basis. For this reason, the bulk of the "readily available" data we are able to provide here are based on the results from AirCell's ongoing, routine testing conducted across the country. We do, however, have a very limited number of call detail records included (Figure 1) that show power level steps resulting from actual customer calls.

Although limited actual customer call data is available as explained above, AirCell presents below data from three separate sources – switch dumps, flight tests and call traces – that should be useful in helping to understand how the AirCell system is working in normal operations.

1. Switch Translation:

Information from "switch dumps" from various operating AirCell sites demonstrate that AirCell sites using Motorola, Lucent or Nortel cellular base station equipment all are operating with the same basic dynamic operating power window (box). The purpose of providing this data is to show that AirCell operates its network in a near identical mode all across the country and the targeted operating levels are not dependent on base station equipment types or locations in any significant manner. These switch dumps also show that the AirCell network is today operating in a manner consistent with the testing done in Texas. This adds credibility to the Texas test results as being truly representative of the AirCell system.

The mobile (aircraft) operating power is dynamically controlled by the ground base station. The ground base station receives the signal, measures its strength and then compares it to a set of desired levels. The set of desired levels is called the "power box." If the received level is below the desired level then the base station commands the mobile to increase power to bring the signal into the "box." If the received signal is "within the box," the base station allows the mobile to stay at the same level. If the received signal is above the power box, the base station commands the mobile to decrease its power level until the signal is within the box. The power box for an AirCell site is very tightly controlled and is typically 4 to 5 dB wide (about one power step for a cellular phone). This means we control the power from the mobile basically as tightly as the mobile power stepping capability can allow.

Finally, note that the power boxes are all at extremely low levels, far below the levels of ordinary cellular operation. AirCell can operate at these levels because:

1) We have cleared nearby channels so there is no co-channel interference;
2) We are operating with "line of sight," meaning that no buildings, trees, etc. block our signal path;
3) Our system is analog, which actually is more sensitive than digital;
4) We experience far less fading than ordinary cellular;
5) Our use of H-Pol antennas gives us rejection of some adjacent channel cellular noise;
6) Our optimized RF receive path at the base stations provides 10 to 15 dB better signal levels before processing.

These low operating levels are illustrated in the attached Figures 2 – 6, as described below:

- For the Lucent CC Communication Switch in Figure 2, note that the power box on the bottom is -115 to -119.8 dBm. This represents three AirCell sites in operation in Nevada.

- Similarly, for the Nortel Switch Translations (Figure 3), note that the power box is set from -112 to -116 dbm. These translations represent five sites operating in Kansas.

- Figure 4 represents Nortel data from three AT&T Wireless sites. Note the AT&T switch offers the same power box settings (-112 dBm to –116 dBm) that are used elsewhere in the AirCell network, even though AT&T Wireless has opposed AirCell's operating authority. This demonstrates that AirCell has not employed any special "less interfering" setup in order to mislead its opponents as to its typical operational settings.

- Figure 5 shows Nortel switch translations for seven sites operated by Centennial Cellular. Again note the -112 to -116 standard power level settings.

- Finally, for the Motorola equipment-based cell site, Figure 6 represents 16 sites, again showing that the base stations are set to force the AirCell mobile to adjust power until the received signal at the ground antenna is between -112 and -116 dBm.

This information demonstrates that regardless of base station equipment used and regardless of location, AirCell consistently operates its network between -112 and -116 for received signal strength at the antenna. This is approximately 30 dB lower than normal terrestrial cellular.

2. Flight Tests:

The second set of information is from typical AirCell flight tests. The first test is a test flight of the cell site located in McClain, Ohio. We typically fly both a circular path around each cell at a radius of about 57.5 miles and a linear fly by. The typical AirCell site has an operating radius of approximately 84 miles. By flying a circular path at a radius of 57.5 miles we have approximately half the area closer to the cell site and half the area away from the flight aircraft. This means that the average power transmitted from the aircraft along that path represents a statistical average for all the aircraft being served by that cell site. (Figure 7)

Figure 8 (Mobile Power levels to Antenna CH 626) shows the series of power readings taken during the flight test. There were 36 readings of 4.3 dBm, 73 readings of 8.2 dBm and eight readings of 12.17 dBm. The power levels vary due to variations in the ground serving antenna patterns and aircraft attitude as the flight progresses.

Note that the mean value is 8.2 dBm. In the Texas test the mean value was recorded in the test report as 6.48 dBm. This is less than a 2 dB variation using totally different aircraft, different flight paths, different locations and different equipment sets six years later. The difference in the step level power is due to the different phone modules' actual power levels and the different cable insertion loss aboard the different test aircraft.

At the end of this document (Figure 12) we have added six more flight test scenarios taken from representative flight tests over the last two years. In each case we show the actual power histogram and the recorded flight path that was flown during the measurement process. These tests are from normal QC audit tests that we perform on a regular basis. They clearly show that the AirCell system operates at consistently low power levels during a variety of flight paths, altitudes, and aircraft attitudes.

3. Call Traces:

Figure 11 contains RF call trace data taken from two different cell sites (sites 141 and 157 in Colorado), showing SDMAC (*i.e.,* power step) readings of 4 (6.62 mW) from a series of calls made September 19, 2001 on a flight test with the same 59 mile radius from the cell site. Figure 1 shows a series of calls on Lucent-based cell sites located in Johnstown, New York (site 198) and Northfield, Massachusetts (site 199). These data were recorded on December 19, 2003. Again, note that all readings show an SDMAC of 3 or 4, indicating the same basic operations and typical power from AirCell airborne transmitters of 16.49 mW to 6.62 mW.

We hope that the information provided above will assist the Division in verifying that:

1) AirCell's Texas tests were, in fact, valid tests;
2) the AirCell system today is operating at very similar levels in real operation as to what was demonstrated in the Texas tests;
3) AirCell cellular partners operate the network consistently at very low levels and consistently from one equipment set to another;
4) AirCell behaves responsibly in monitoring, testing, and calibrating its network with its cellular partners; and
5) all flight tests demonstrate that, in normal operation, AirCell mobiles are operating at average power levels in the 8.2 dbm (6.62 mW) range.

Please contact us with any questions regarding this submission.

Respectfully Submitted,

/s/ Jim Stinehelfer

Jim Stinehelfer
President AirCell Inc.

cc: Katherine M. Harris
Michael D. Sullivan
Qualex International

Figure 1
RF Call Trace

The following document represents an RF Call Trace as performed on a Lucent 5ESS Cellular Switch located in Burlington, VT. This switch serves the Johnstown, NY and Northfield, MA cell sites in which AirCell is collocated. The function of the RF Call trace is to record the signal strengths on all sectors of the candidate cell site for an active call. The RF Call Trace also provides information about the mobile unit in terms of the current Voice Mobile Attenuation Code (VMAC) during each measurement interval. VMAC is referred to as SDMAC in this document. AirCell operates on the Omni Face only in these sites.

```
# FTrftrace -d3195404223 -i 30 -D -f -o -n -p 10
-f ignored when -n is specified

ps -ef
RF Calltrace Locate Request 12/19/03 at 11:26:57
Call trace DN: 3195404223                       Tag:
Serving cell: 199 Vrg:  0 Ra:  2 TS: 0SAT: 0
Serving channel:   39 Antenna: Omni    SG: 0
DCS:  1 Trkgrp: 199 Member:   2 SCM 10
Poll Count:     1 Call trace cells: 199 198


RF Calltrace Group 1 Neighbor List 12/19/03 at 11:26:57
Call trace DN: 3195404223                       Tag:
Serving Cell: 199   Server Group: 0   Antenna Face: 0

Cell  Antenna  Srv  Sub  MFA  Ho
Site   Faces   Grp  Grp       Bias

 198     01     0    0    N      3

RF Calltrace locate reply from cell 198 12/19/03 at 11:26:58
Call trace DN: 3195404223               Tag:    Measurement: dBm
Omni SG0: -109  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -130
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130

RF Calltrace locate reply from cell 199 12/19/03 at 11:26:58
Call trace DN: 3195404223               Tag:    Measurement: dBm
Omni SG0:  -92  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -130
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130
SDMAC:   4      Error Status:   0
Serving RCU: -118


RF Calltrace Locate Request 12/19/03 at 11:27:57
Call trace DN: 3195404223                       Tag:
Serving cell: 199 Vrg:  0 Ra:  2 TS: 0SAT: 0
Serving channel:   39 Antenna: Omni    SG: 0
DCS:  1 Trkgrp: 199 Member:   2 SCM 10
Poll Count:     2 Call trace cells: 199 198
```

Figure 1
RF Call Trace

```
RF Calltrace Group 1 Neighbor List 12/19/03 at 11:27:57
Call trace DN: 3195404223                       Tag:
Serving Cell: 199   Server Group: 0   Antenna Face: 0

Cell  Antenna  Srv  Sub  MFA  Ho
Site   Faces   Grp  Grp       Bias

 198     01     0    0    N      3


RF Calltrace locate reply from cell 198 12/19/03 at 11:27:57
Call trace DN: 3195404223               Tag:    Measurement: dBm
Omni SG0: -108  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -130
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130

RF Calltrace locate reply from cell 199 12/19/03 at 11:27:57
Call trace DN: 3195404223               Tag:    Measurement: dBm
Omni SG0:  -94  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -130
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130
SDMAC:   4      Error Status:   0
Serving RCU: -97

RF Calltrace Locate Request 12/19/03 at 11:28:06
Call trace DN: 3195404223                       Tag:
Serving cell: 199 Vrg:  0 Ra:  2 TS: 0SAT: 0
Serving channel:   39 Antenna: Omni    SG: 0
DCS:  1 Trkgrp: 199 Member:   2 SCM 10
Poll Count:     3 Call trace cells: 199 198


RF Calltrace locate reply from cell 198 12/19/03 at 11:28:07
Call trace DN: 3195404223               Tag:    Measurement: dBm
Omni SG0: -103  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -130
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130

RF Calltrace locate reply from cell 199 12/19/03 at 11:28:07
Call trace DN: 3195404223               Tag:    Measurement: dBm
Omni SG0:  -88  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -130
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130
SDMAC:   4      Error Status:   0
Serving RCU: -97

RF Calltrace Locate Request 12/19/03 at 11:28:16
Call trace DN: 3195404223                       Tag:
Serving cell: 199 Vrg:  0 Ra:  2 TS: 0SAT: 0
Serving channel:   39 Antenna: Omni    SG: 0
DCS:  1 Trkgrp: 199 Member:   2 SCM 10
Poll Count:     4 Call trace cells: 199 198
```

Figure 1
RF Call Trace

```
RF Calltrace locate reply from cell 198 12/19/03 at 11:28:17
Call trace DN: 3195404223               Tag:    Measurement: dBm
Omni SG0: -104  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -130
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130

RF Calltrace locate reply from cell 199 12/19/03 at 11:28:17
Call trace DN: 3195404223               Tag:    Measurement: dBm
Omni SG0:  -91  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -130
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130
SDMAC:   4      Error Status:   0
Serving RCU: -93

RF Calltrace Locate Request 12/19/03 at 11:28:26
Call trace DN: 3195404223                       Tag:
Serving cell: 199 Vrg:  0 Ra:  2 TS: 0SAT: 0
Serving channel:   39 Antenna: Omni    SG: 0
DCS:  1 Trkgrp: 199 Member:   2 SCM 10
Poll Count:     5 Call trace cells: 199 198


RF Calltrace locate reply from cell 199 12/19/03 at 11:28:26
Call trace DN: 3195404223               Tag:    Measurement: dBm
Omni SG0:  -89  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -130
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130
SDMAC:   3      Error Status:   0
Serving RCU: -94

RF Calltrace locate reply from cell 198 12/19/03 at 11:28:26
Call trace DN: 3195404223               Tag:    Measurement: dBm
Omni SG0: -103  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -130
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130

RF Calltrace Locate Request 12/19/03 at 11:28:36
Call trace DN: 3195404223                       Tag:
Serving cell: 199 Vrg:  0 Ra:  2 TS: 0SAT: 0
Serving channel:   39 Antenna: Omni    SG: 0
DCS:  1 Trkgrp: 199 Member:   2 SCM 10
Poll Count:     6 Call trace cells: 199 198
```

Figure 1
RF Call Trace

```
RF Calltrace locate reply from cell 198 12/19/03 at 11:28:36
Call trace DN: 3195404223               Tag:    Measurement: dBm
Omni SG0: -104  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -130
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130

RF Calltrace locate reply from cell 199 12/19/03 at 11:28:36
Call trace DN: 3195404223               Tag:    Measurement: dBm
Omni SG0:  -89  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -130
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130
SDMAC:   3      Error Status:   0
Serving RCU: -94

RF Calltrace Locate Request 12/19/03 at 11:28:46
Call trace DN: 3195404223                       Tag:
Serving cell: 199 Vrg:  0 Ra:  2 TS: 0SAT: 0
Serving channel:   39 Antenna: Omni    SG: 0
DCS:  1 Trkgrp: 199 Member:   2 SCM 10
Poll Count:     7 Call trace cells: 199 198


RF Calltrace locate reply from cell 198 12/19/03 at 11:28:46
Call trace DN: 3195404223               Tag:    Measurement: dBm
Omni SG0: -100  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -130
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130

RF Calltrace locate reply from cell 199 12/19/03 at 11:28:46
Call trace DN: 3195404223               Tag:    Measurement: dBm
Omni SG0:  -91  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -130
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130
SDMAC:   4      Error Status:   0
Serving RCU: -95

RF Calltrace Locate Request 12/19/03 at 11:28:56
Call trace DN: 3195404223                       Tag:
Serving cell: 199 Vrg:  0 Ra:  2 TS: 0SAT: 0
Serving channel:   39 Antenna: Omni    SG: 0
DCS:  1 Trkgrp: 199 Member:   2 SCM 10
Poll Count:     8 Call trace cells: 199 198

RF Calltrace locate reply from cell 198 12/19/03 at 11:28:56
Call trace DN: 3195404223               Tag:    Measurement: dBm
Omni SG0: -102  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -130
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130
```

Figure 1
RF Call Trace

```
RF Calltrace locate reply from cell 199 12/19/03 at 11:28:56
Call trace DN: 3195404223               Tag:    Measurement: dBm
Omni SG0:  -90  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -130
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130
SDMAC:   3      Error Status:   0
Serving RCU: -95

RF Calltrace Locate Request 12/19/03 at 11:29:06
Call trace DN: 3195404223                       Tag:
Serving cell: 199 Vrg:  0 Ra:  2 TS: 0SAT: 0
Serving channel:   39 Antenna: Omni    SG: 0
DCS:  1 Trkgrp: 199 Member:   2 SCM 10
Poll Count:     9 Call trace cells: 199 198


RF Calltrace locate reply from cell 199 12/19/03 at 11:29:06
Call trace DN: 3195404223               Tag:    Measurement: dBm
Omni SG0:  -88  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -130
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130
SDMAC:   3      Error Status:   0
Serving RCU: -95

RF Calltrace locate reply from cell 198 12/19/03 at 11:29:06
Call trace DN: 3195404223               Tag:    Measurement: dBm
Omni SG0: -104  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -130
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130

RF Calltrace Locate Request 12/19/03 at 11:29:16
Call trace DN: 3195404223                       Tag:
Serving cell: 199 Vrg:  0 Ra:  2 TS: 0SAT: 0
Serving channel:   39 Antenna: Omni    SG: 0
DCS:  1 Trkgrp: 199 Member:   2 SCM 10
Poll Count:    10 Call trace cells: 199 198


RF Calltrace locate reply from cell 199 12/19/03 at 11:29:16
Call trace DN: 3195404223               Tag:    Measurement: dBm
Omni SG0:  -87  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -130
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130
SDMAC:   3      Error Status:   0
Serving RCU: -92

RF Calltrace locate reply from cell 198 12/19/03 at 11:29:16
Call trace DN: 3195404223               Tag:    Measurement: dBm
Omni SG0: -102  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -130
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130
```

Figure 1
RF Call Trace

```
RF Calltrace Locate Request 12/19/03 at 11:29:26
Call trace DN: 3195404223                       Tag:
Serving cell: 199 Vrg:  0 Ra:  2 TS: 0SAT: 0
Serving channel:   39 Antenna: Omni    SG: 0
DCS:  1 Trkgrp: 199 Member:   2 SCM 10
Poll Count:    11 Call trace cells: 199 198


RF Calltrace locate reply from cell 198 12/19/03 at 11:29:26
Call trace DN: 3195404223               Tag:    Measurement: dBm
Omni SG0: -105  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -130
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130

RF Calltrace locate reply from cell 199 12/19/03 at 11:29:26
Call trace DN: 3195404223               Tag:    Measurement: dBm
Omni SG0:  -88  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -130
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130
SDMAC:   3      Error Status:   0
Serving RCU: -91

RF Calltrace Locate Request 12/19/03 at 11:29:35
Call trace DN: 3195404223                       Tag:
Serving cell: 199 Vrg:  0 Ra:  2 TS: 0SAT: 0
Serving channel:   39 Antenna: Omni    SG: 0
DCS:  1 Trkgrp: 199 Member:   2 SCM 10
Poll Count:    12 Call trace cells: 199 198


RF Calltrace locate reply from cell 199 12/19/03 at 11:29:36
Call trace DN: 3195404223               Tag:    Measurement: dBm
Omni SG0:  -87  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -130
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130
SDMAC:   3      Error Status:   0
Serving RCU: -91

RF Calltrace locate reply from cell 198 12/19/03 at 11:29:36
Call trace DN: 3195404223               Tag:    Measurement: dBm
Omni SG0: -105  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -130
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130
```

Figure 2
Translations Resident in Lucent CC Communications Switch

```
Wed Apr 23 15:44:58 2003     fci

_____________________________________________________________________________
 AUTOPLEX
 Cellular               FACE CODE INFORMATION (fci)              Screen 3 of 20
 System                 Cell 1    SG 0  Face 4

                    Uplink Dynamic Power Control (DPC)
                           AMPS          TDMA
                         Mobile        Mobile         Cell
   Power Control State..... 37) 1        41)  1         46) 0
   Target (RSSI)........... 38) 48       42)  70        47) 78
   Window (RSSI)........... 39) 3        43)  15        48) 8
   Slope................... 40) 0        44)  0         49) 0
   Series 1 Power Amplifier Identifier ..................... 50) 0
   Amplifier Power Differential (RSSI)...................... 51) 11
   TDMA Target Signal on Handoff (RSSI)..................... 52) 0

      Bit Error Rate (BER) / Uplink Dynamic Power Control (DPC)

   BER-Control DPC Feature State.......................... 53) 3
   Mobile BER High Threshold.............................. 54) 180
   Mobile BER Low Threshold............................... 55) 80
```

Target RSSI is the translatable parameter which sets the center of the mobile station power control boundaries. This is measured at the input to the transceiver and reflects all of the gains and losses within the receive path after the antenna. Target RSSI operates in conjunction with the Window parameter to set the upper and lower mobile station power control boundaries.

With a Target RSSI of 48 RSSI units and a Window of 3 RSSI units, the upper and lower mobile station power control boundaries are:

48 RSSI + 3 RSSI = 51 RSSI Upper Boundary

48 RSSI – 3 RSSI = 45 RSSI Lower Boundary

Recalling that all measurements are made at the input to the transceiver and reflect the sum of all gains and losses in the receive path and the AirCell configures it’s Autoplex Series II base stations for a net receive path gain of 25.3 dB, then:

51 RSSI = -90 dBm

45 RSSI = -94.5 dBm

-90 dBm – 25.3 dB = -115 dBm Upper Boundary at input to the base station

-94.5 dBm – 25.3 dB = -119.8 dBm Lower Boundary at input to the base station

Figure 3
Translations Resident in Nortel Alltel Switch

```
2003/07/12 22:47 LD488910 ALLTEL MOUNDRIDGE MTXC0011 FINAL XA_IMG 07/12/2003
TABLE: PWRCTRL
PWRKEY VMAC CMAC MSPC BSPC
--------------------------

5Y 2 2 Y -97DB -93DB Y DISABLED
>pos 69y
69Y 2 2 Y -97DB -93DB Y DISABLED
>pos 35y 0
35Y 2 2 Y -97DB -93DB Y DISABLED
>pos 56y 0
56Y 2 2 Y -97DB -93DB Y DISABLED
>pos 110y 0
110Y 2 2 Y -97DB -93DB Y DISABLED
```

Site #	VMAC	CMAC	DPCTL	DPCTH	MSPC	BSPC
5Y	2	2	**-97DB**	**-93DB**	Y	DISABLED

VMAC: Voice Mobile Attenuation Control
CMAC: Control Mobile Attenuation Control
DPCTL: Dynamic Power Control Threshold Low
DPCTH: Dynamic Power Control Threshold High
MSPC: Mobile Station Power Control
BSPC: Base Station Power Control

DPCTL is the translatable parameter which sets the lower boundary of the mobile station power control. This is measured at the input to the tranceiver and reflects all of the gains and losses within the receive path after the antenna. When the measured signal strength from the mobile falls below this value, the mobile will be commanded to increase it's transmit power by one step or 4 dB. This process will continue until the signal strength is within the DPCTL and DPCTH boundaries.

DPCTH is the translatable parameter which sets the upper boundary of the mobile station power control. This is measured at the input to the tranceiver and reflects all of the gains and losses within the receive path after the antenna. When the measured signal strength from the mobile is above this value, the mobile will be commanded to decrease it's transmit power by one step or 4 dB. This process will continue until the signal strength is within the DPCTL and DPCTH boundaries.

The net receive path gain for a Nortel base stations utilized by AirCell is 19 dB.
Therefore, the signal strength at the input to the base station receive input is:

-93 dBm – 19 dB = -112 dBm Upper boundary

-97 dBm – 19 dB = -116 dBm Lower boundary

Figure 4
Translations Resident in Nortel AT&T Wireless Switches

Harrisburg

2003/08/21 20:24 LD487930 AT&T WIRELESS HARRISBURG HRBGPACM1MD MTX11 XAC 082103

TABLE: PWRCTRL

PWRKEY VMAC CMAC MSPC BSPC

---

200 2 2 Y **-97DB -93DB** Y DISABLED

Charleston

TABLE: PWRCTRL

PWRKEY VMAC CMAC MSPC BSPC

17U 2 2 Y **-97DB -93DB** Y DISABLED

Wilkes-Barre

TABLE: PWRCTRL

PWRKEY VMAC CMAC MSPC BSPC

201Z 2 2 **Y -97DB -93DB** Y DISABLED

Site #	VMAC	CMAC	DPCTL	DPCTH	MSPC	BSPC
200	2	2	**-97DB**	**-93DB**	Y	DISABLED

VMAC: Voice Mobile Attenuation Control
CMAC: Control Mobile Attenuation Control
DPCTL: Dynamic Power Control Threshold Low
DPCTH: Dynamic Power Control Threshold High
MSPC: Mobile Station Power Control
BSPC: Base Station Power Control

DPCTL is the translatable parameter which sets the lower boundary of the mobile station power control. This is measured at the input to the tranceiver and reflects all of the gains and losses within the receive path after the antenna. When the measured signal strength from the mobile falls below this value, the mobile will be commanded to increase it's transmit power by one step or 4 dB. This process will continue until the signal strength is within the DPCTL and DPCTH boundaries.

DPCTH is the translatable parameter which sets the upper boundary of the mobile station power control. This is measured at the input to the tranceiver and reflects all of the gains and losses within the receive path after the antenna. When the measured signal strength from the mobile is above this value, the mobile will be commanded to decrease it's transmit power by one step or 4 dB. This process will continue until the signal strength is within the DPCTL and DPCTH boundaries.

The net receive path gain for a Nortel base stations utilized by AirCell is 19 dB.
Therefore, the signal strength at the input to the base station receive input is:

-93 dBm – 19 dB = -112 dBm Upper boundary

-97 dBm – 19 dB = -116 dBm Lower boundary

Figure 5
Translations Resident in Nortel Centennial Wireless Switches

Table Pwrctrl:

22Y 2 2 Y -97DB -93DB Y DISABLED

Site #	VMAC	CMAC	DPCTL	DPCTH	MSPC	BSPC
22Y	2	2	**-97DB**	**-93DB**	Y	DISABLED

VMAC: Voice Mobile Attenuation Control
CMAC: Control Mobile Attenuation Control
DPCTL: Dynamic Power Control Threshold Low
DPCTH: Dynamic Power Control Threshold High
MSPC: Mobile Station Power Control
BSPC: Base Station Power Control

DPCTL is the translatable parameter which sets the lower boundary of the mobile station power control. This is measured at the input to the tranceiver and reflects all of the gains and losses within the receive path after the antenna. When the measured signal strength from the mobile falls below this value, the mobile will be commanded to increase it's transmit power by one step or 4 dB. This process will continue until the signal strength is within the DPCTL and DPCTH boundaries.

DPCTH is the translatable parameter which sets the upper boundary of the mobile station power control. This is measured at the input to the tranceiver and reflects all of the gains and losses within the receive path after the antenna. When the measured signal strength from the mobile is above this value, the mobile will be commanded to decrease it's transmit power by one step or 4 dB. This process will continue until the signal strength is within the DPCTL and DPCTH boundaries.

The net receive path gain for a Nortel base stations utilized by AirCell is 19 dB.
Therefore, the signal strength at the input to the base station receive input is:

-93 dBm – 19 dB = -112 dBm Upper boundary

-97 dBm – 19 dB = -116 dBm Lower boundary

Figure 5
Translations Resident in Nortel Centennial Wireless Switches

Table Pwrctrl:

126Y 2 2 Y -97DB -93DB Y DISABLED

Site #	VMAC	CMAC	DPCTL	DPCTH	MSPC	BSPC
22Y	2	2	**-97DB**	**-93DB**	Y	DISABLED

VMAC: Voice Mobile Attenuation Control
CMAC: Control Mobile Attenuation Control
DPCTL: Dynamic Power Control Threshold Low
DPCTH: Dynamic Power Control Threshold High
MSPC: Mobile Station Power Control
BSPC: Base Station Power Control

DPCTL is the translatable parameter which sets the lower boundary of the mobile station power control. This is measured at the input to the tranceiver and reflects all of the gains and losses within the receive path after the antenna. When the measured signal strength from the mobile falls below this value, the mobile will be commanded to increase it's transmit power by one step or 4 dB. This process will continue until the signal strength is within the DPCTL and DPCTH boundaries.

DPCTH is the translatable parameter which sets the upper boundary of the mobile station power control. This is measured at the input to the tranceiver and reflects all of the gains and losses within the receive path after the antenna. When the measured signal strength from the mobile is above this value, the mobile will be commanded to decrease it's transmit power by one step or 4 dB. This process will continue until the signal strength is within the DPCTL and DPCTH boundaries.

The net receive path gain for a Nortel base stations utilized by AirCell is 19 dB.
Therefore, the signal strength at the input to the base station receive input is:

-93 dBm – 19 dB = -112 dBm Upper boundary

-97 dBm – 19 dB = -116 dBm Lower boundary

Figure 5
Translations Resident in Nortel Centennial Wireless Switches

Table Pwrctrl:

127Y 2 2 Y -97DB -93DB Y DISABLED

Site #	VMAC	CMAC	DPCTL	DPCTH	MSPC	BSPC
22Y	2	2	**-97DB**	**-93DB**	Y	DISABLED

VMAC: Voice Mobile Attenuation Control
CMAC: Control Mobile Attenuation Control
DPCTL: Dynamic Power Control Threshold Low
DPCTH: Dynamic Power Control Threshold High
MSPC: Mobile Station Power Control
BSPC: Base Station Power Control

DPCTL is the translatable parameter which sets the lower boundary of the mobile station power control. This is measured at the input to the tranceiver and reflects all of the gains and losses within the receive path after the antenna. When the measured signal strength from the mobile falls below this value, the mobile will be commanded to increase it's transmit power by one step or 4 dB. This process will continue until the signal strength is within the DPCTL and DPCTH boundaries.

DPCTH is the translatable parameter which sets the upper boundary of the mobile station power control. This is measured at the input to the tranceiver and reflects all of the gains and losses within the receive path after the antenna. When the measured signal strength from the mobile is above this value, the mobile will be commanded to decrease it's transmit power by one step or 4 dB. This process will continue until the signal strength is within the DPCTL and DPCTH boundaries.

The net receive path gain for a Nortel base stations utilized by AirCell is 19 dB.
Therefore, the signal strength at the input to the base station receive input is:

-93 dBm – 19 dB = -112 dBm Upper boundary

-97 dBm – 19 dB = -116 dBm Lower boundary

Figure 6
Translations Resident In Alltel Motorola Switches

****

CEL # = CELL NUMBER
CMPFLG = COMPARE FLAG
PSHO = POWER SETTING FOR HANDOFF
NIHO = # OF INDICATORS REQUIRED FOR HANDOFF
MAXSS = MAXIMUM SIGNAL STRENGTH
MAXRED = # OF MAXIMUM READINGS REQUIRED FOR POWER REDUCTION
MINSS = MINIMUM SIGNAL STRENGTH
MINR = # OF MINIMUM SIGNAL STRENGTH READINGS REQUIRED FOR POWER INCREASE
#RCANT = # OF READINGS REQUIRED TO CHANGE ANTENNAS
PWRVAL = ABSOLUTE/RELATIVE POWER VALUE
CHFCT = CHAN FOREIGN CARRIER THRESHOLD
LNAOFF = LOW NOISE AMPLIFIER OFFSET
NOMSS = NOMINAL SIGNAL STRENGTH
MAXPL = MAXIMUM POWER LEVEL
EHOTHR = EMERGENCY HANDOFF THRESHOLD
OUMAX = OVERLAY/UNDERLAY MAXIMUM POWER LEVEL
OUEHT = OVERLAY/UNDERLAY EMERGENCY HANDOFF THRESHOLD
SIGFCT = SIG FOREIGN CARRIER THRESHOLD

Charleston Site: 197

CEL #	CMP FLG	PS HO	NI HO	MAX SS	MAX RED	MIN SS	MIN R	#RC ANT	PWR VAL	CH FCT	LNA OFF	NOM SS	MAX PL	EHO THR	OU MAX	OU EHT	SIG FCT
197	REL	75	3	**78**	3	**70**	2	2	7	121	51	74	2	0	0	NA	123

****
Charlotte Site: 505

CEL #	CMP FLG	PS HO	NI HO	MAX SS	MAX RED	MIN SS	MIN R	#RC ANT	PWR VAL	CH FCT	LNA OFF	NOM SS	MAX PL	EHO THR	OU MAX	OU EHT	SIG FCT
505	REL	112	2	**78**	2	**70**	2	2	10	90	51	130	0	90	0	NA	90

****
Augusta Site: 150

CEL #	CMP FLG	PS HO	NI HO	MAX SS	MAX RED	MIN SS	MIN R	#RC ANT	PWR VAL	CH FCT	LNA OFF	NOM SS	MAX PL	EHO THR	OU MAX	OU EHT	SIG FCT
150	REL	75	2	**78**	2	**70**	2	2	7	121	51	74	0	0	0	NA	0

OMNIPRM

MAXSS: MAX SIGNAL STRENGTH:

Maximum signal strength (in SSU) required before reducing the mobile power. Use –105 dBm (measured at RX antenna input). Equals 78 SSU's.

[-105 dBm + 7 dB = -112 dBm
7 dB is measured net gain from RX antenna input to input to voice transceiver.

MINSS: MIN SIGNAL STRENGTH:

Minimum signal strength (in SSU) required before increasing the mobile power. Use –109 dBm (measured at RX antenna input). Equals 70 SSU's.

[-109 dBm + 7 dB = -116 dBm
7 dB is measured net gain from RX antenna input to input to voice transceiver.

Figure 6
Translations Resident In Alltel Motorola Switches

MINR: NUMBER OF MIN READINGS:

Number of minimum signal strength readings required (1-15) required for a mobile power increase. Use 2.

MAXSS is the translatable parameter which sets the upper limit of the mobile station power control boundaries. This is measured at the input to the transceiver and reflects all of the gains and losses within the receive path after the antenna.

With a MAXSS of 78 RSSU's and a MINSS of 70 RSSU's, the upper and lower mobile station power control boundaries are:

78 RSSI = -105 dBm Upper Boundary

70 RSSI = -109 dBm Lower Boundary

Recalling that all measurements are made at the input to the transceiver and reflect the sum of all gains and losses in the receive path and the AirCell configures it's HD2 base stations for a net receive path gain of 7 dB, then:

-105 dBm – 7 dB = -112 dBm Upper Boundary at input to the base station.

-109 dBm – 7 dB = -116 dBm Lower Boundary at input to the base station.

Figure 7

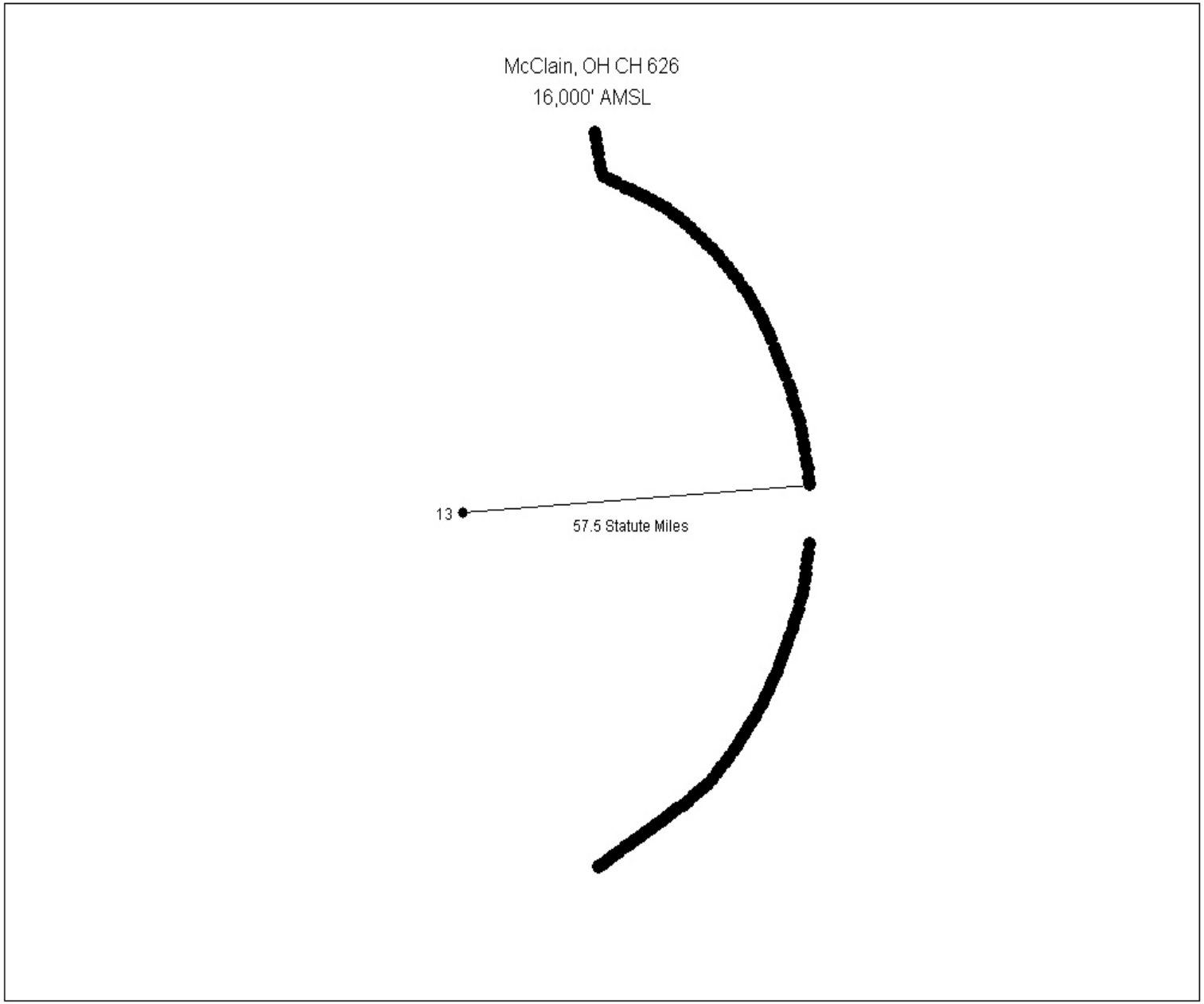


Figure 8

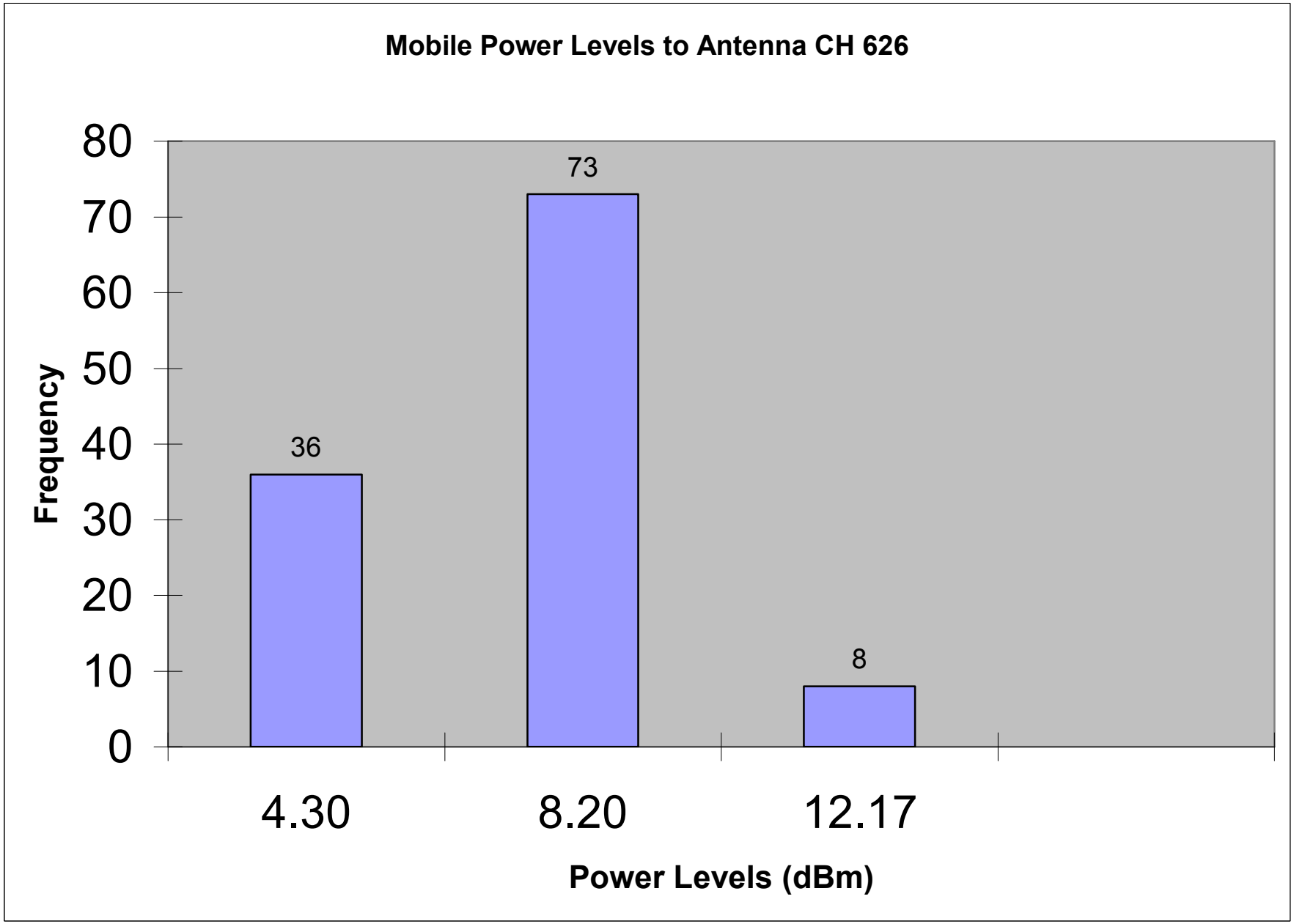

Mobile Power Levels to Antenna CH 626
80
70
60
50
40
30
20
10
0
Frequency
36
73
8
4.30
8.20
12.17
Power Levels (dBm)

Figure 9

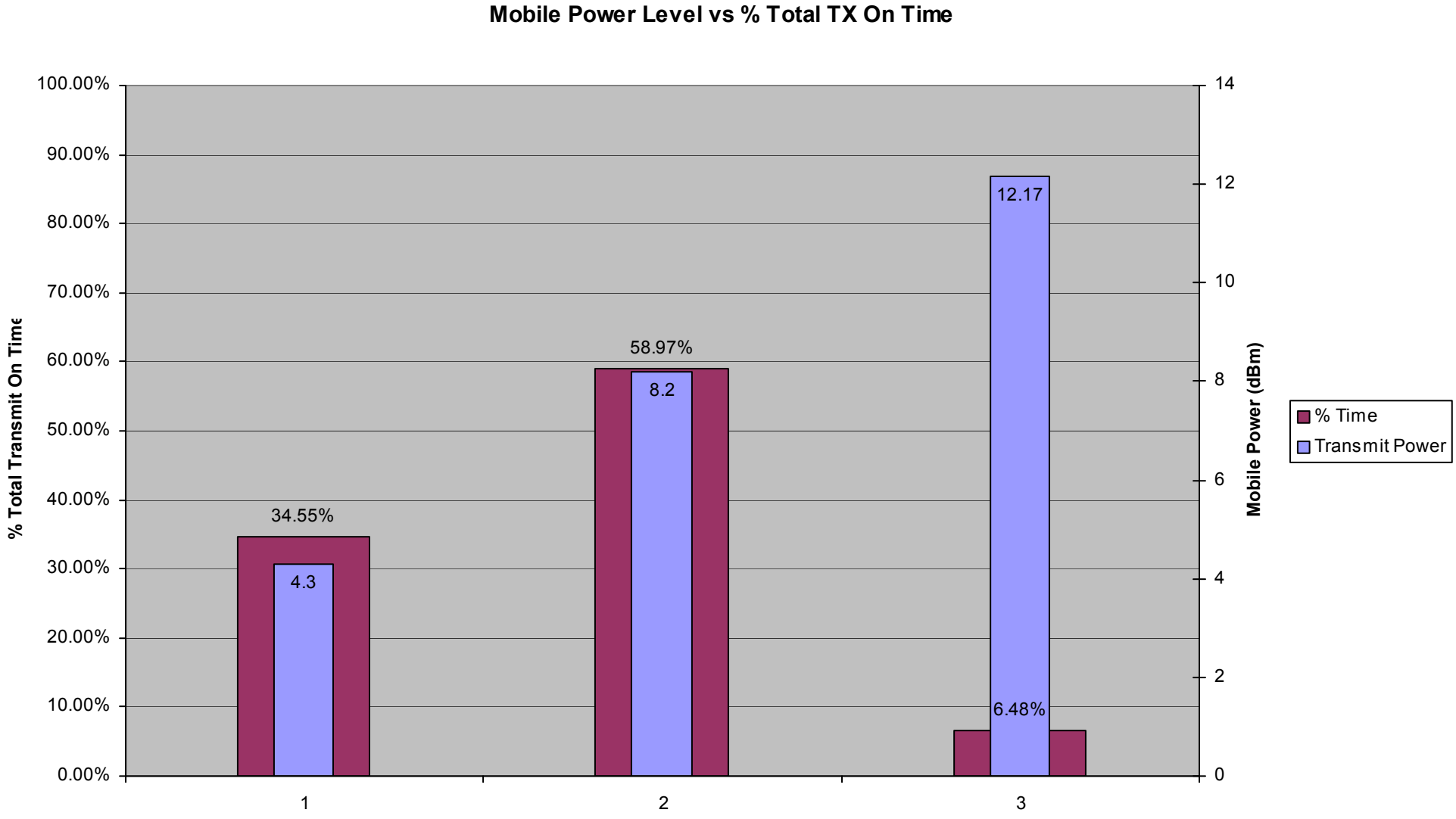

Mobile Power Level vs % Total TX On Time
% Total Transmit On Time
Mobile Power (dBm)
100.00%
90.00%
80.00%
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
14
12
10
8
6
4
2
0
34.55%
4.3
58.97%
8.2
12.17
6.48%
1
2
3
% Time
Transmit Power

Figure 10
Typical Mobile Output Power Levels

PL	Mobile Output Power (mW)	Mobile Output Power (dBm)	Output Power at AMU (dBm)	Output Power at AMU (mW)
2	360	25.56	16.06	40.39
3	147	21.67	12.17	16.49
4	59	17.71	8.21	6.62
5	24	13.80	4.30	2.69
6	9	9.54	0.04	1.01
7	3	4.77	-4.73	0.34

Figure 11
RF Call Trace

The following document represents an RF Call Trace as performed on a Lucent 5ESS Cellular Switch located in Pueblo, CO. This switch serves the Limon and Las Animas, CO cell sites in which AirCell is collocated. The function of the RF Call trace is to record the signal strengths on all sectors of the candidate cell site for an active call. The RF Call Trace also provides information about the mobile unit in terms of the current Voice Mobile Attenuation Code (VMAC) during each measurement interval. VMAC is referred to as SDMAC in this document. AirCell operates on the Gamma Face only in these sites.

```
FTrftrace  -d 3195401603 -o -p 10 -D
-c or -n options not specified, defaulting to -n.

RF Calltrace Locate Request 09/19/01 at 11:27:05
Call trace DN: 3195401603               Tag:
Serving cell: 157 Vrg:  0 Ra: 19 TS: 0SAT: 1
Serving channel:   72 Antenna: Gamma   SG: 0
DCS:  7 Trkgrp: 257 Member:  19 SCM 14
Poll Count:     1 Call trace cells: 157 141


RF Calltrace Group 1 Neighbor List 09/19/01 at 11:27:05
Call trace DN: 3195401603               Tag:
Serving Cell: 157   Server Group: 0   Antenna Face: 3

Cell  Antenna  Srv  Sub  MFA  Ho
Site   Faces   Grp  Grp       Bias

 141     08     0    0    N      5

RF Calltrace locate reply from cell 141 09/19/01 at 11:27:06
Call trace DN: 3195401603       Tag:    Measurement: dBm
Omni SG0: -130  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -102
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130

RF Calltrace locate reply from cell 157 09/19/01 at 11:27:06
Call trace DN: 3195401603       Tag:    Measurement: dBm
Omni SG0: -130  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -101
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130
SDMAC:    4      Error Status:   0
Serving RCU: -94

RF Calltrace Locate Request 09/19/01 at 11:27:15
Call trace DN: 3195401603               Tag:
Serving cell: 157 Vrg:  0 Ra: 19 TS: 0SAT: 1
Serving channel:   72 Antenna: Gamma   SG: 0
DCS:  7 Trkgrp: 257 Member:  19 SCM 14
Poll Count:     2 Call trace cells: 157 141
```

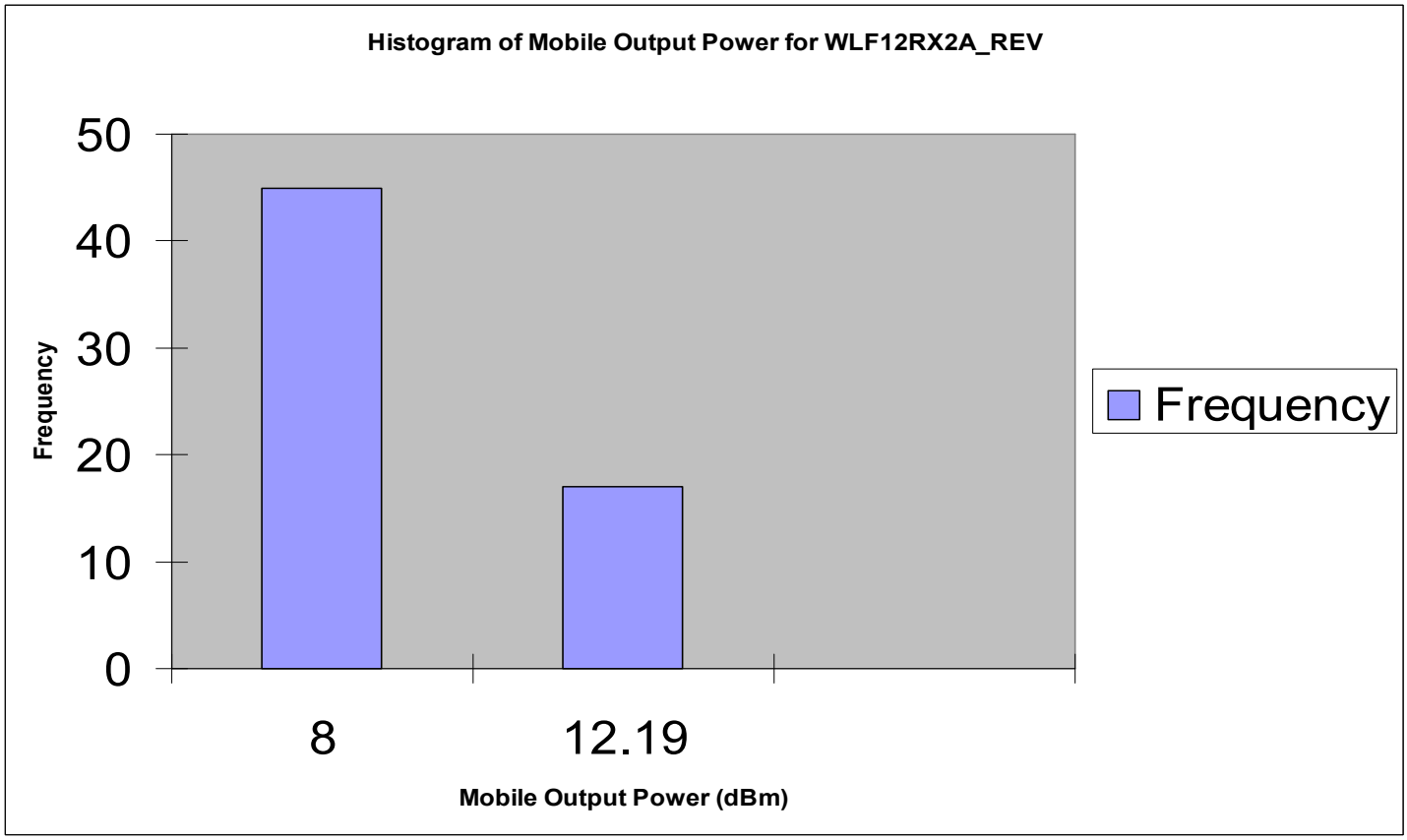
Figure 11
Typical RF Call Trace

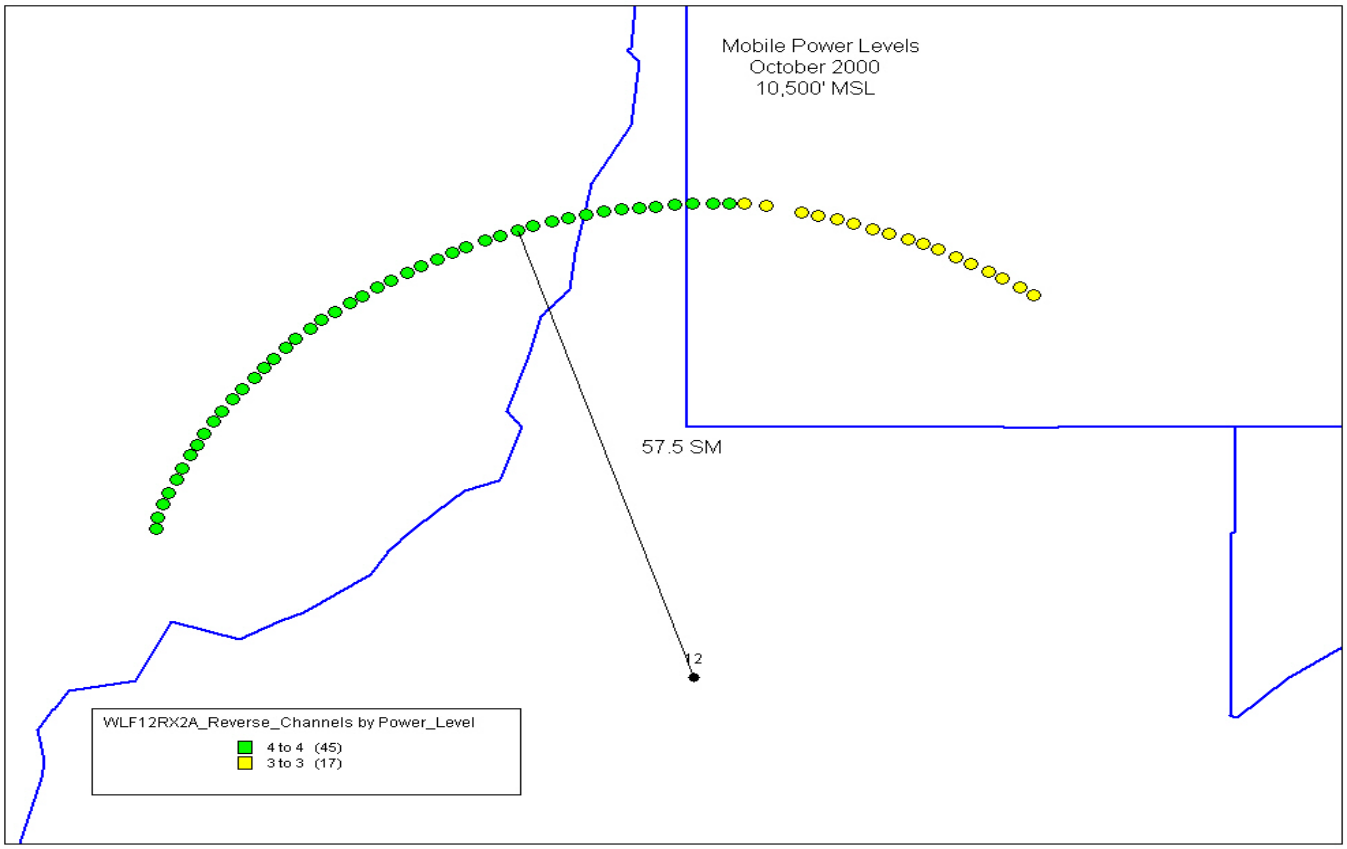
```
RF Calltrace locate reply from cell 157 09/19/01 at 11:27:15
Call trace DN: 3195401603       Tag:    Measurement: dBm
Omni SG0: -130  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -98
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130
SDMAC:   4      Error Status:   0
Serving RCU: -94

RF Calltrace locate reply from cell 141 09/19/01 at 11:27:15
Call trace DN: 3195401603       Tag:    Measurement: dBm
Omni SG0: -130  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -103
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130

RF Calltrace Locate Request 09/19/01 at 11:27:25
Call trace DN: 3195401603               Tag:
Serving cell: 157 Vrg:  0 Ra: 19 TS: 0SAT: 1
Serving channel:   72 Antenna: Gamma   SG: 0
DCS:  7 Trkgrp: 257 Member:  19 SCM 14
Poll Count:     3 Call trace cells: 157 141


RF Calltrace locate reply from cell 141 09/19/01 at 11:27:25
Call trace DN: 3195401603       Tag:    Measurement: dBm
Omni SG0: -130  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -101
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130

RF Calltrace locate reply from cell 157 09/19/01 at 11:27:25
Call trace DN: 3195401603       Tag:    Measurement: dBm
Omni SG0: -130  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -98
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130
SDMAC:   4      Error Status:   0
Serving RCU: -94

RF Calltrace Locate Request 09/19/01 at 11:27:35
Call trace DN: 3195401603               Tag:
Serving cell: 157 Vrg:  0 Ra: 19 TS: 0SAT: 1
Serving channel:   72 Antenna: Gamma   SG: 0
DCS:  7 Trkgrp: 257 Member:  19 SCM 14
Poll Count:     4 Call trace cells: 157 141


RF Calltrace locate reply from cell 157 09/19/01 at 11:27:35
Call trace DN: 3195401603       Tag:    Measurement: dBm
Omni SG0: -130  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -98
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130
SDMAC:   4      Error Status:   0
Serving RCU: -95
```

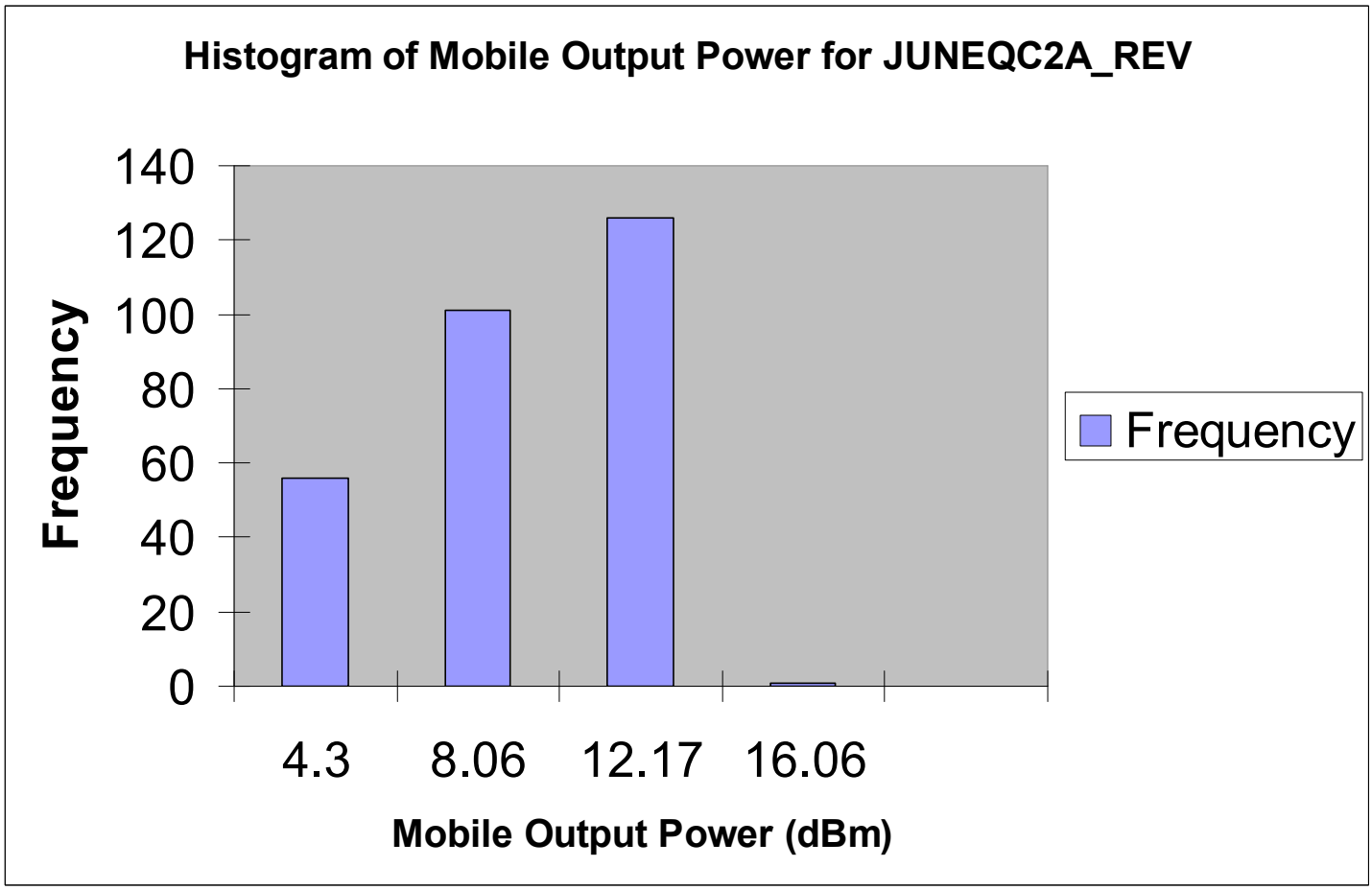
Figure 11
Typical RF Call Trace

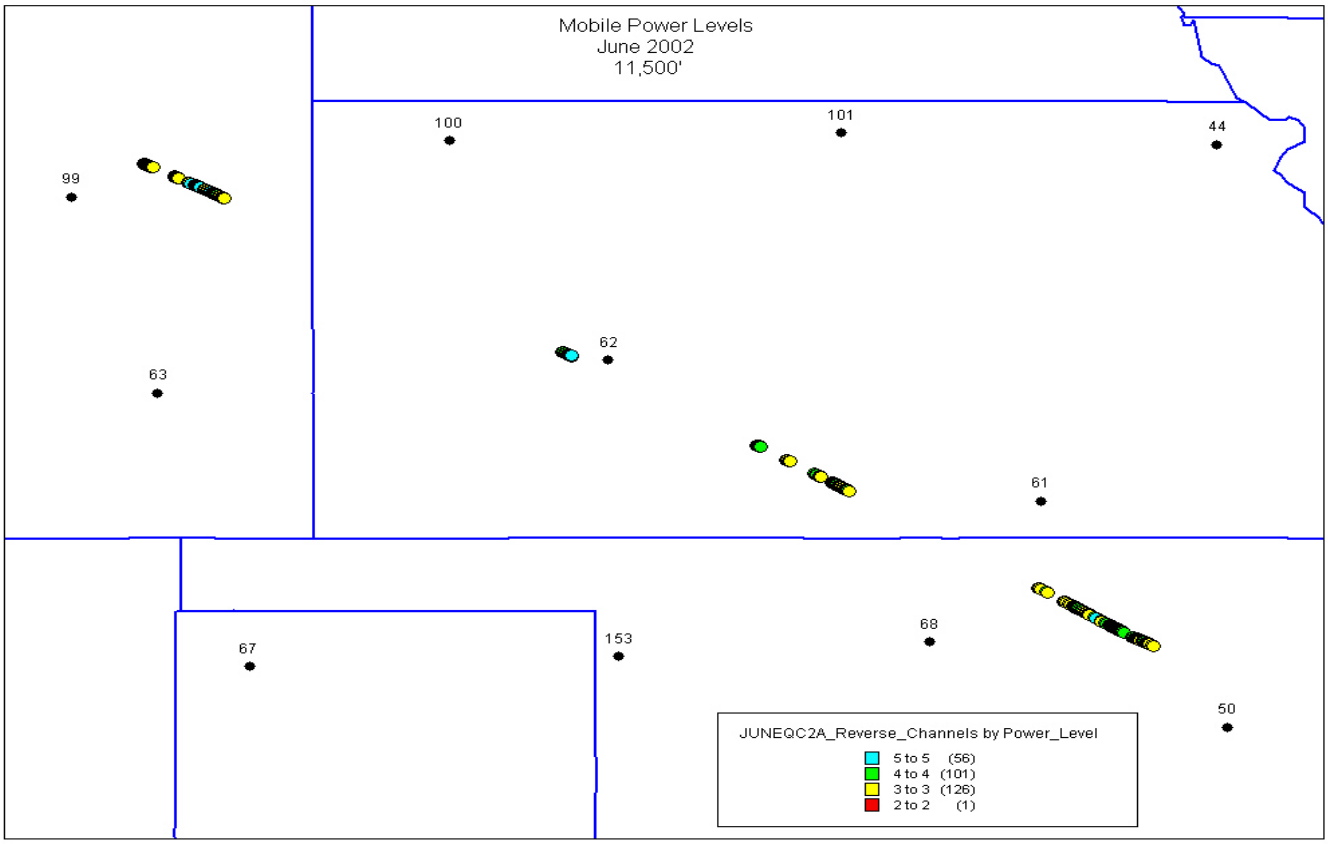
```
RF Calltrace locate reply from cell 141 09/19/01 at 11:27:35
Call trace DN: 3195401603       Tag:    Measurement: dBm
Omni SG0: -130  Alpha SG0:   -130        Beta SG0: -130  Gamma SG0: -99
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130

RF Calltrace Locate Request 09/19/01 at 11:28:26
Call trace DN: 3195401603               Tag:
Serving cell: 157 Vrg:  0 Ra: 19 TS: 0SAT: 1
Serving channel:   72 Antenna: Gamma   SG: 0
DCS:  7 Trkgrp: 257 Member:  19 SCM 14
Poll Count:     5 Call trace cells: 157 141


RF Calltrace Group 1 Neighbor List 09/19/01 at 11:28:26
Call trace DN: 3195401603               Tag:
Serving Cell: 157   Server Group: 0   Antenna Face: 3

Cell  Antenna  Srv  Sub  MFA  Ho
Site   Faces   Grp  Grp       Bias

 141     08     0    0    N      5

RF Calltrace locate reply from cell 157 09/19/01 at 11:28:26
Call trace DN: 3195401603       Tag:    Measurement: dBm
Omni SG0: -130  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -130
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130
SDMAC:   4      Error Status:   1
Serving RCU: -95

RF Calltrace locate reply from cell 141 09/19/01 at 11:28:26
Call trace DN: 3195401603       Tag:    Measurement: dBm
Omni SG0: -130  Alpha SG0:  -130        Beta SG0: -130  Gamma SG0: -93
Delta SG0: -130 Epsilon SG0: -130       Zeta SG0: -130
Omni SG1: -130  Alpha SG1:  -130        Beta SG1: -130  Gamma SG1: -130
Delta SG1: -130 Epsilon SG1: -130       Zeta SG1: -130


^CStopping FTrftrace and closing Log Files
```

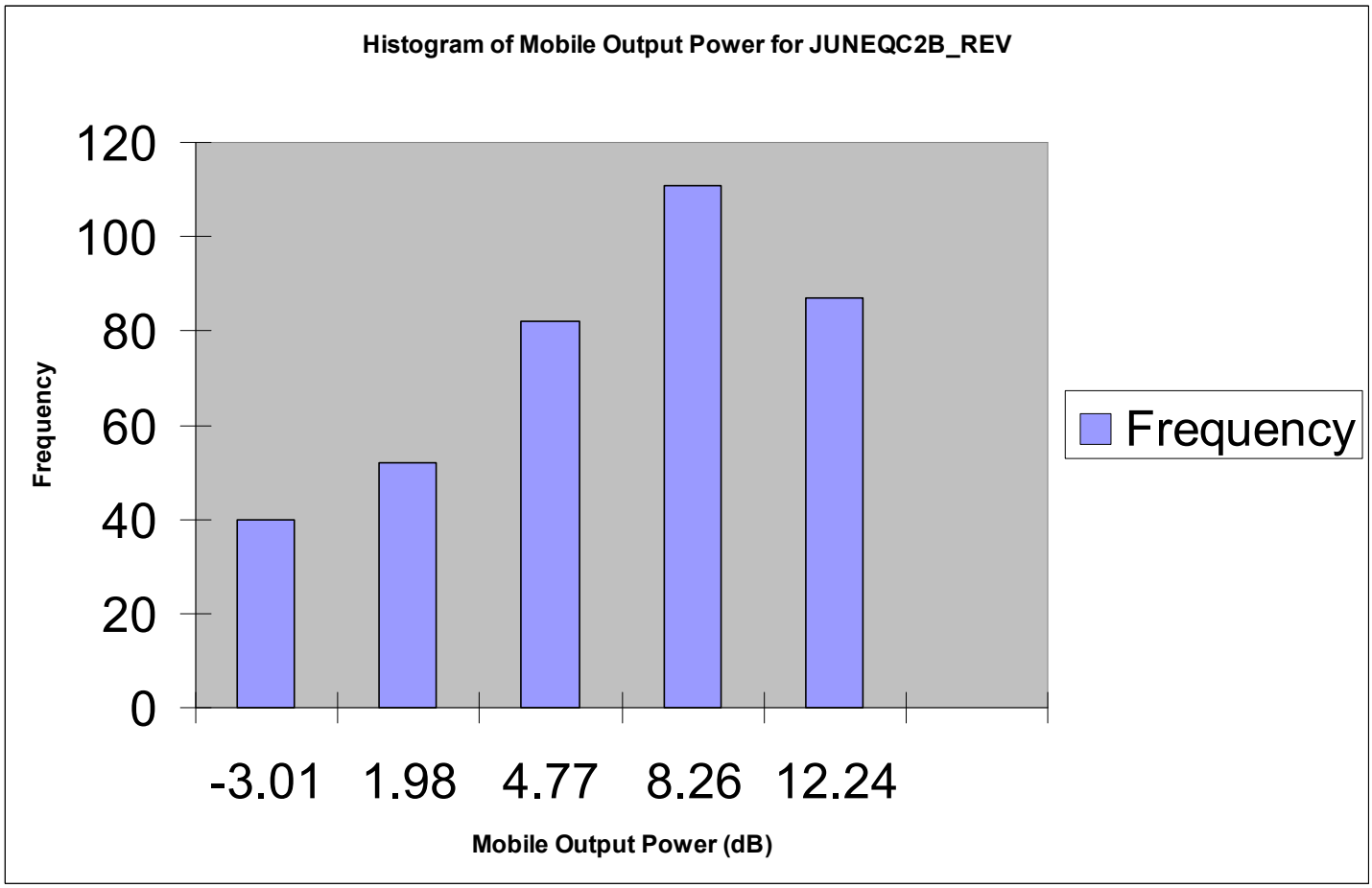
Figure 12

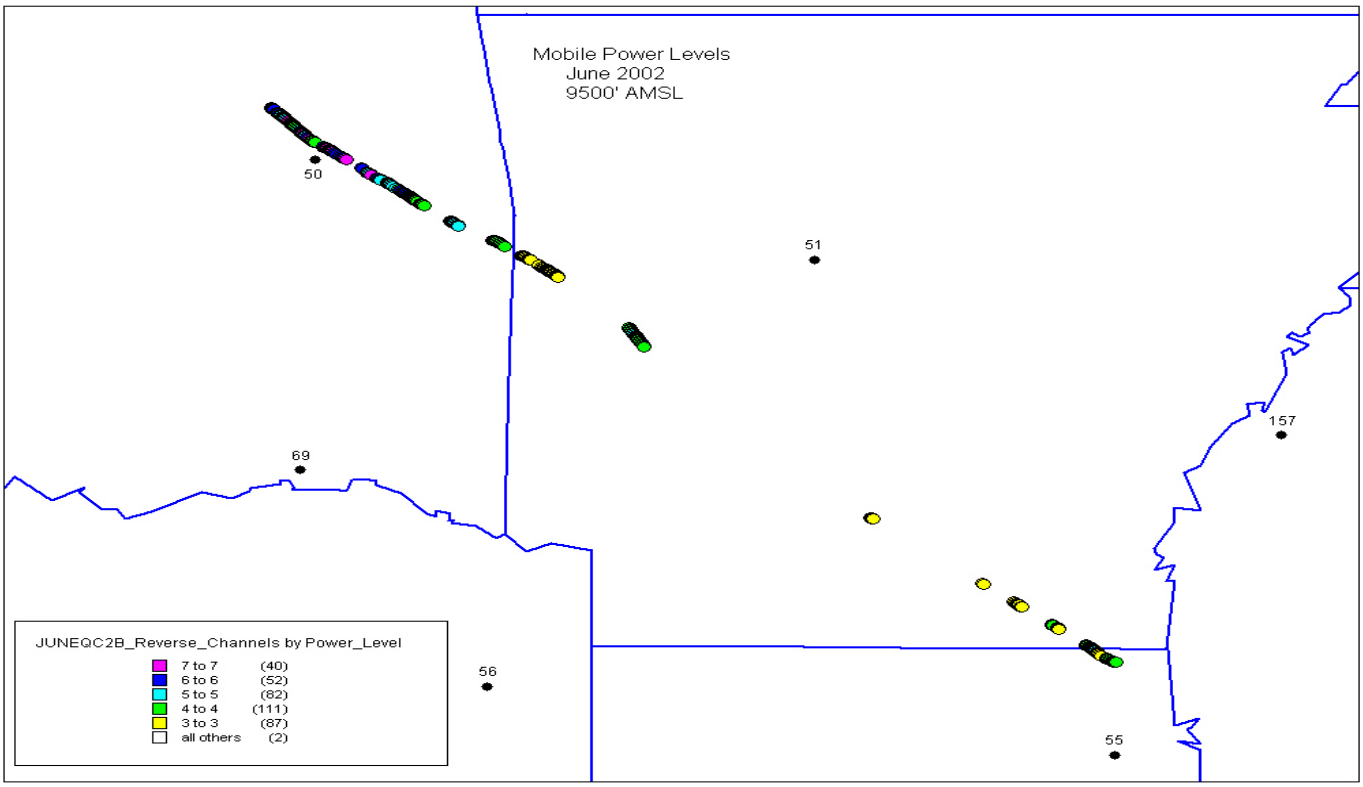

Histogram of Mobile Output Power for WLF12RX2A_REV
50
40
30
20
10
0
Frequency
8
12.19
Mobile Output Power (dBm)
Frequency

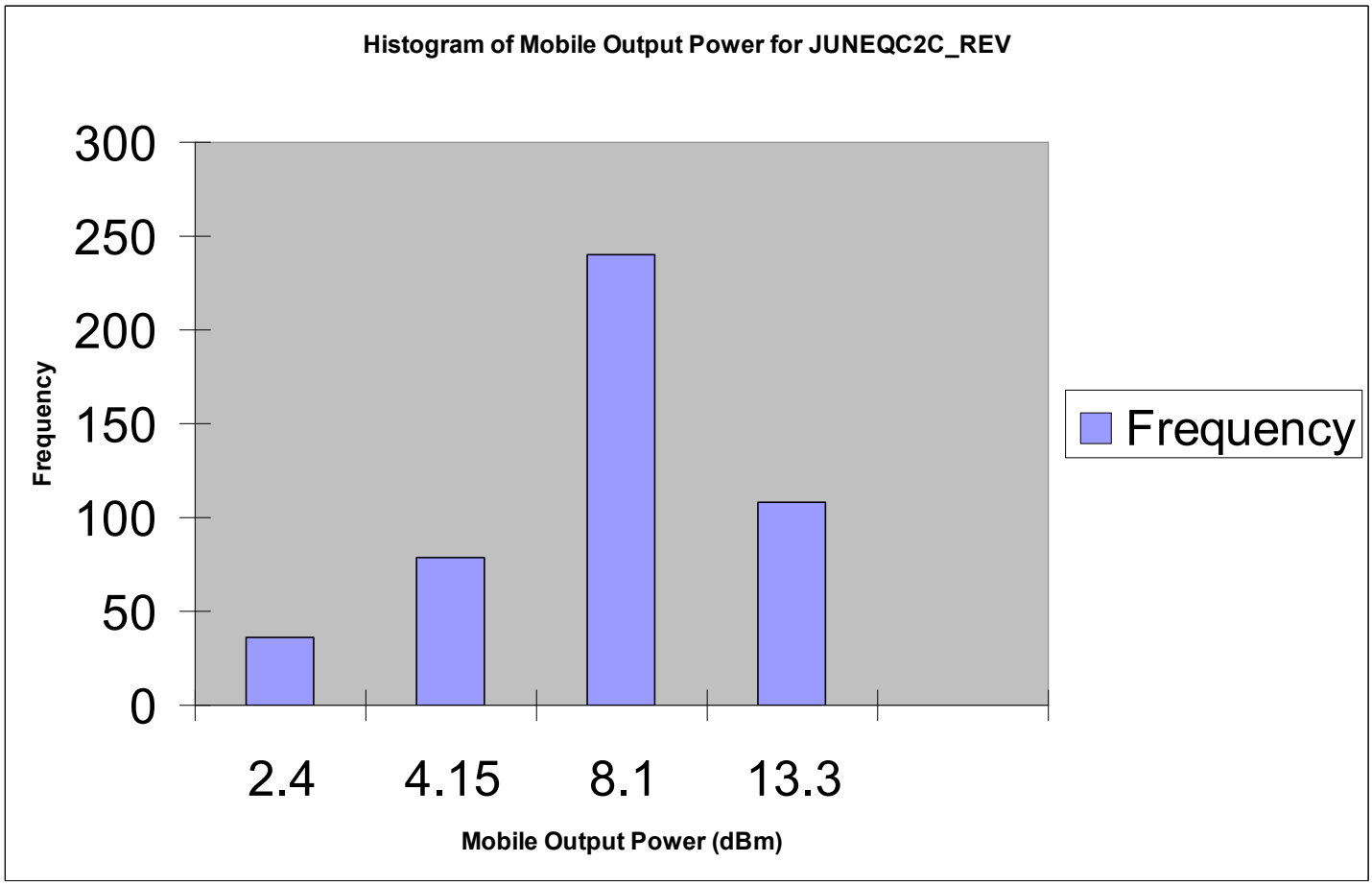

Mobile Power Levels
October 2000
10,500' MSL
57.5 SM
12
WLF12RX2A_Reverse_Channels by Power_Level
4 to 4 (45)
3 to 3 (17)

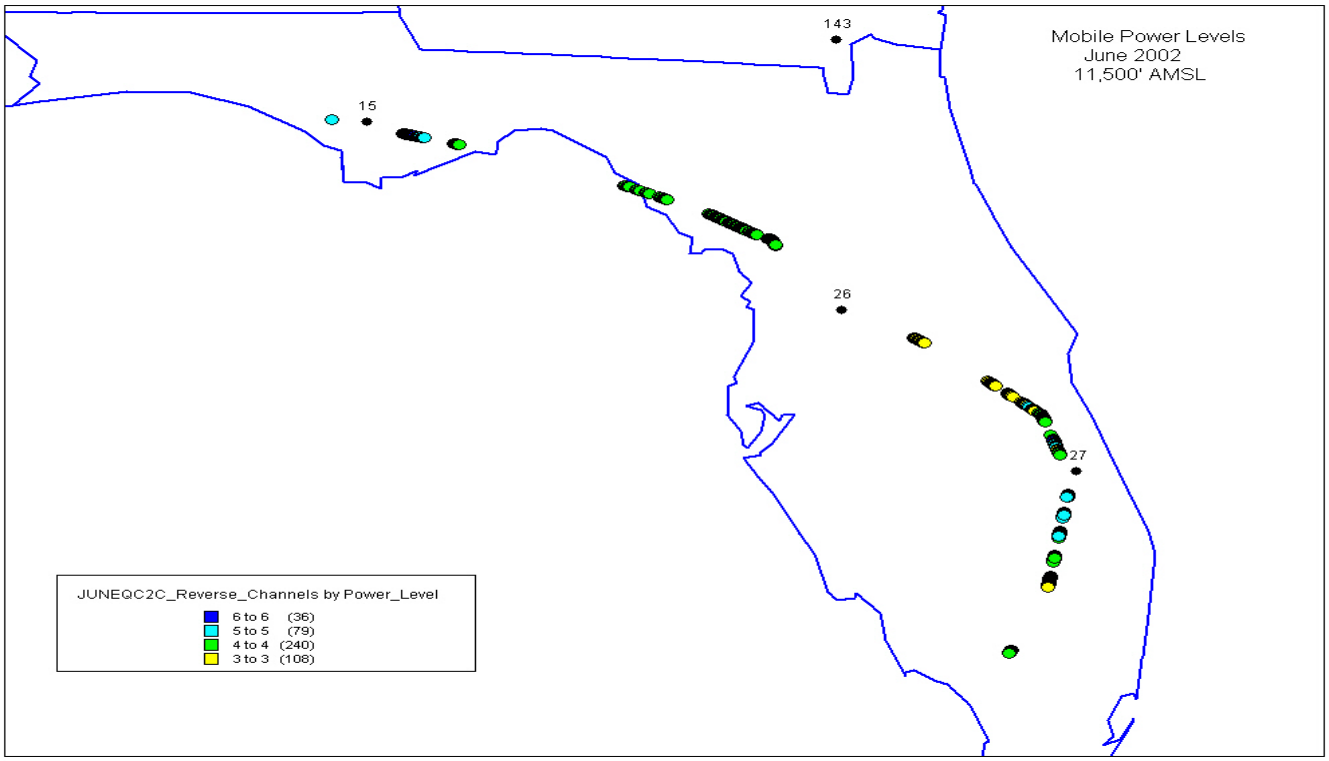

Histogram of Mobile Output Power for JUNEQC2A_REV
Frequency
140
120
100
80
60
40
20
0
4.3
8.06
12.17
16.06
Mobile Output Power (dBm)
Frequency

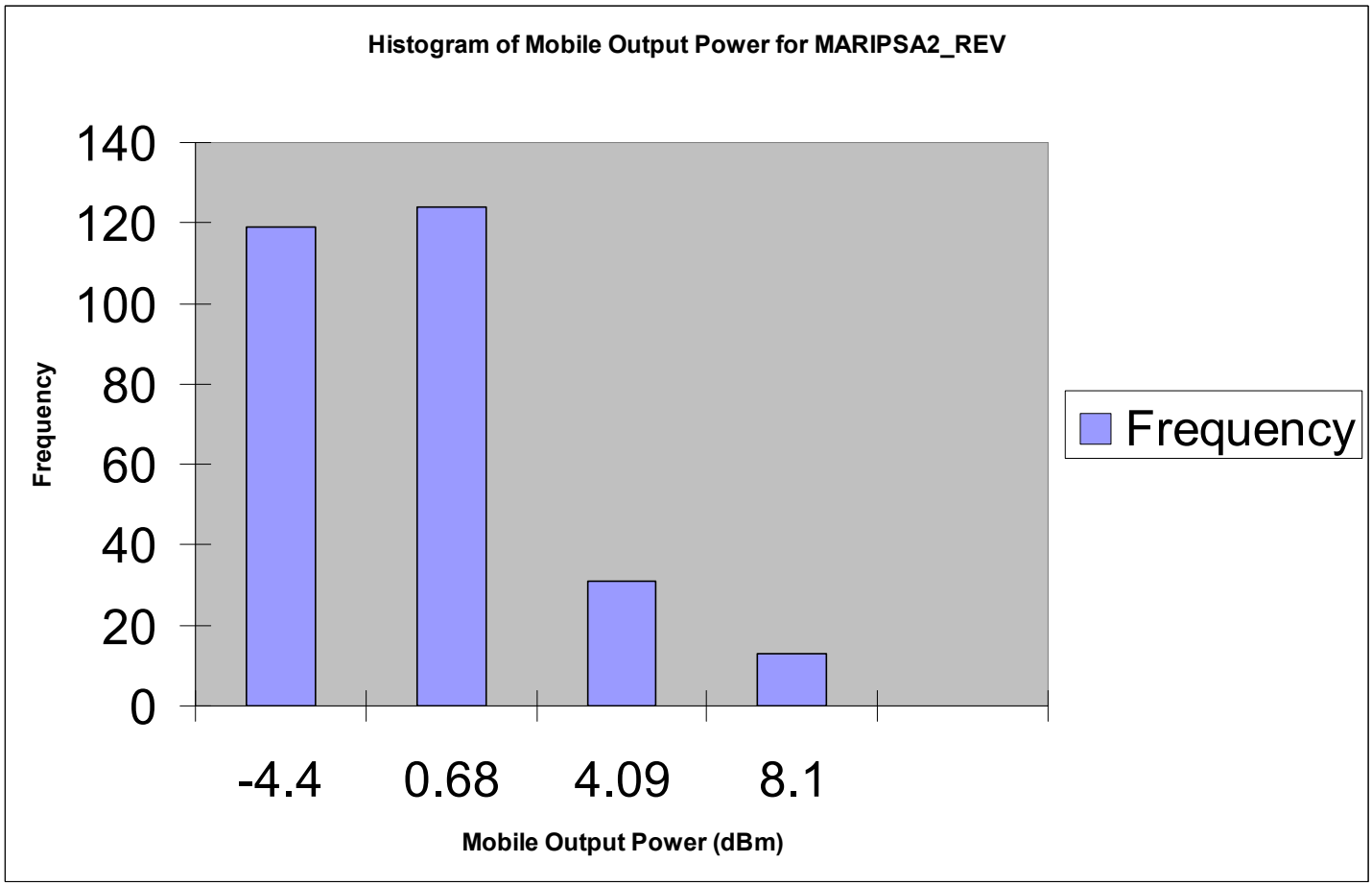

Mobile Power Levels
June 2002
11,500'
100
101
44
99
62
63
61
67
153
68
50
JUNEQC2A_Reverse_Channels by Power_Level
5 to 5 (56)
4 to 4 (101)
3 to 3 (126)
2 to 2 (1)

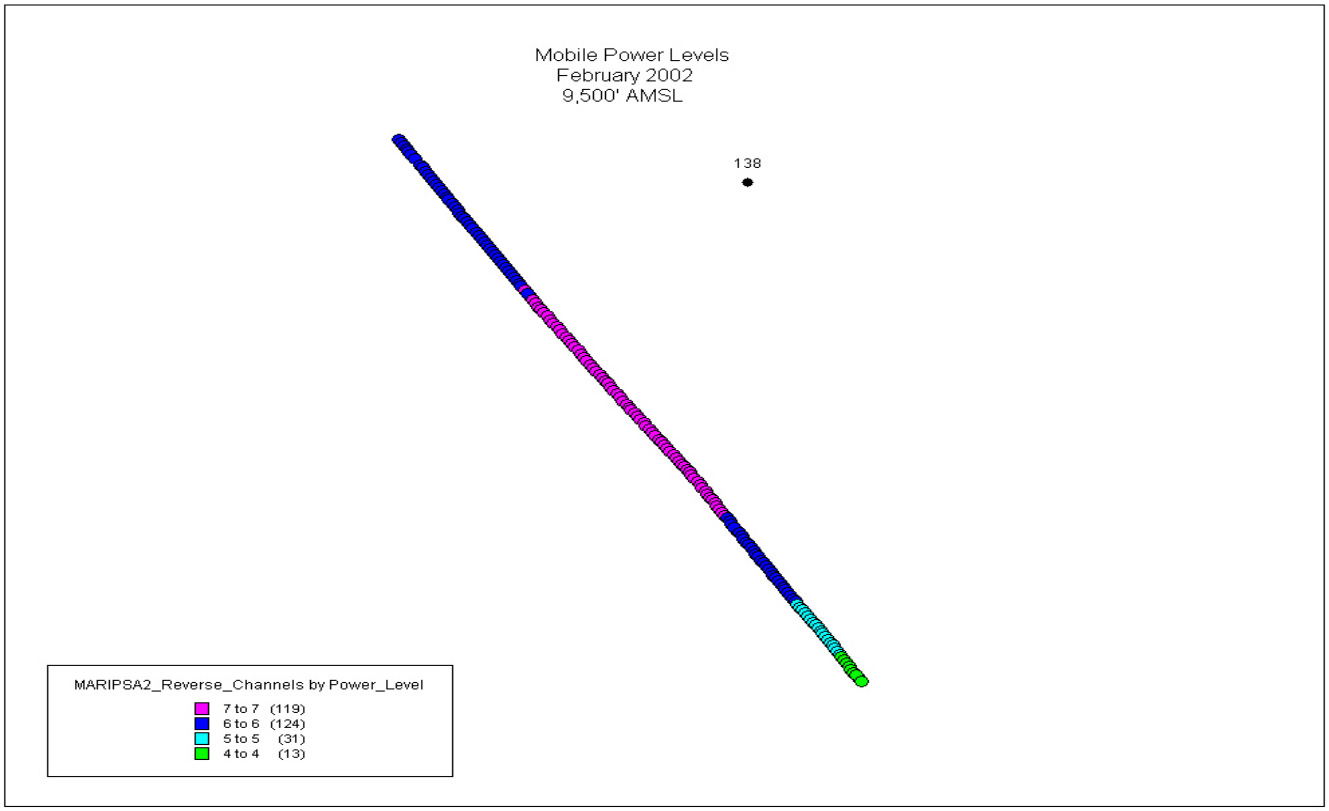

Histogram of Mobile Output Power for JUNEQC2B_REV
120
100
80
60
40
20
0
Frequency
-3.01
1.98
4.77
8.26
12.24
Mobile Output Power (dB)
Frequency

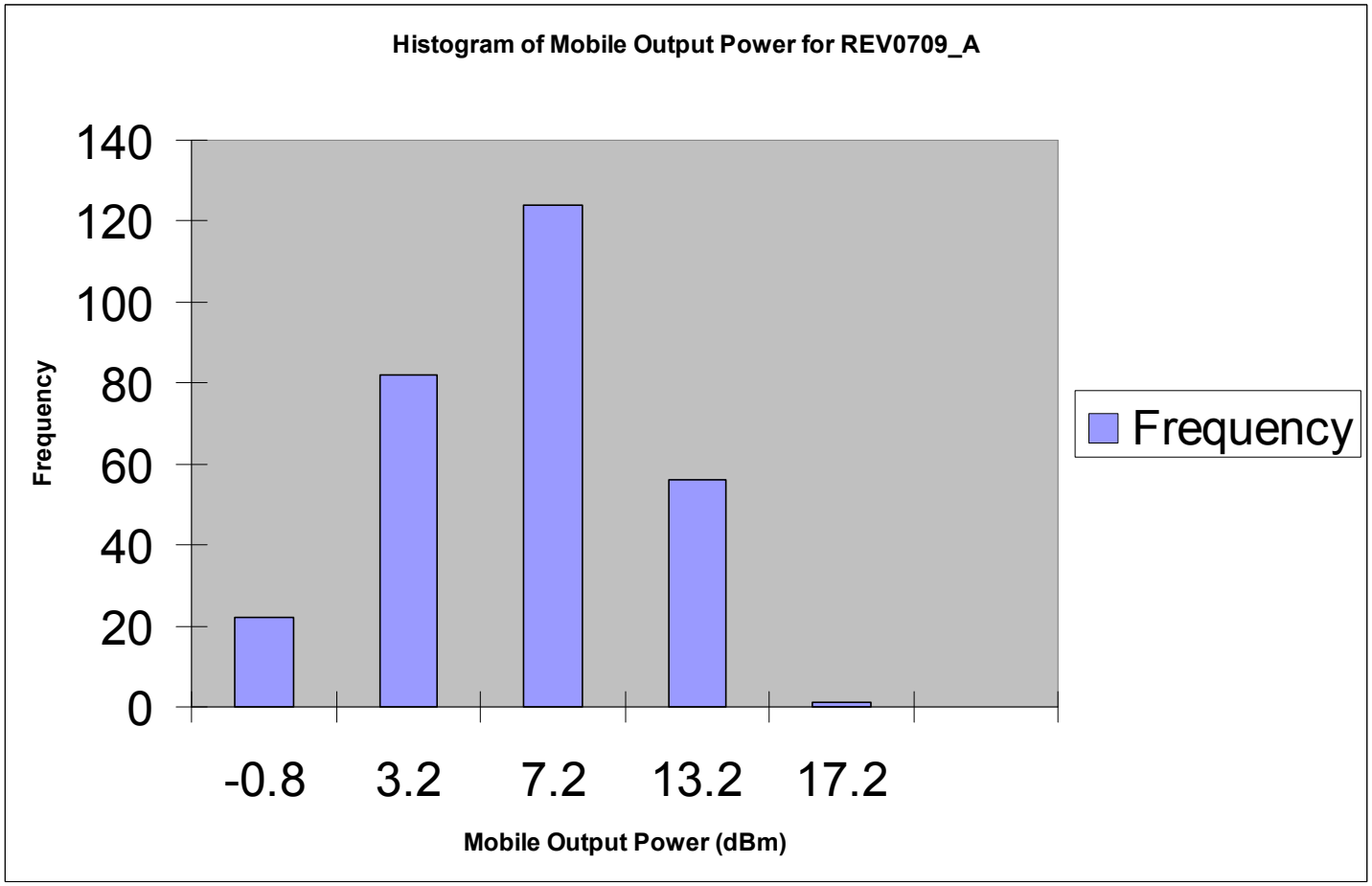

Mobile Power Levels
June 2002
9500' AMSL
50
51
69
157
56
55
JUNEQC2B_Reverse_Channels by Power_Level
7 to 7 (40)
6 to 6 (52)
5 to 5 (82)
4 to 4 (111)
3 to 3 (87)
all others (2)

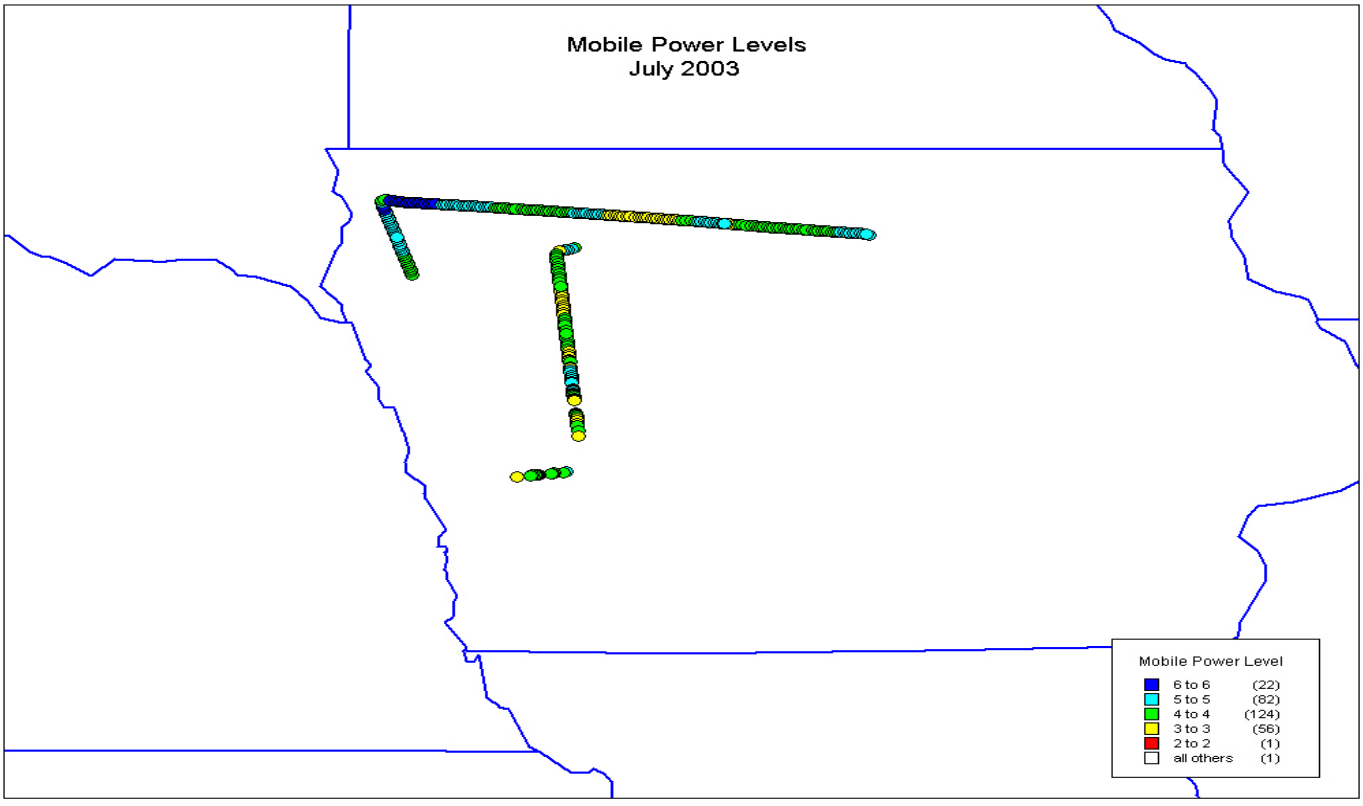

Histogram of Mobile Output Power for JUNEQC2C_REV
300
250
200
150
100
50
0
Frequency
2.4
4.15
8.1
13.3
Mobile Output Power (dBm)
Frequency


Mobile Power Levels
June 2002
11,500' AMSL
143
15
26
27
JUNEQC2C_Reverse_Channels by Power_Level
6 to 6 (36)
5 to 5 (79)
4 to 4 (240)
3 to 3 (108)


Histogram of Mobile Output Power for MARIPSA2_REV
140
120
100
80
60
40
20
0
Frequency
-4.4
0.68
4.09
8.1
Mobile Output Power (dBm)
Frequency


Mobile Power Levels
February 2002
9,500' AMSL
138
MARIPSA2_Reverse_Channels by Power_Level
7 to 7 (119)
6 to 6 (124)
5 to 5 (31)
4 to 4 (13)


Histogram of Mobile Output Power for REV0709_A
140
120
100
80
60
40
20
0
Frequency
-0.8
3.2
7.2
13.2
17.2
Mobile Output Power (dBm)
Frequency


Mobile Power Levels
July 2003
Mobile Power Level
6 to 6 (22)
5 to 5 (82)
4 to 4 (124)
3 to 3 (56)
2 to 2 (1)
all others (1)